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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/651,036	05/17/96	OWEN	M 26860/33.47

IM21/0403

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EXAMINER	
MILLS,G	
ART UNIT	**PAPER NUMBER**
1742	

DATE MAILED: 04/03/98

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 08/651,036	Applicant(s) Owen et al.
	Examiner Gregory Mills	Group Art Unit 1742

☒ Responsive to communication(s) filed on *3/10/98*.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *three* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *1, 2, 4-18, 20-22, 24, 26, 29, and 31-34* is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☒ Claim(s) *1, 2, 4-6, 9-13, 16-18, 21, 22, 24, and 26* is/are allowed.

☒ Claim(s) *7, 8, 14, 15, 20, 29, 31, 33, and 34* is/are rejected.

☒ Claim(s) *32* is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐approved ☐disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). *13*

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

1. The request filed on 3/10/98 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 08/651,036 is acceptable and a CPA has been established. An action on the CPA follows.

2. The Group and/or Art Unit location of your application in the PTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Group Art Unit 1742.

3. Claim 29 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 29 depends from claim 28, which has been cancelled.

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 7, 8, 14, 15, 20, and 29 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to

reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1 requires the use of first and second distinct repetition rates to produce first and second distinct output powers. Dependent claims 7, 8, 14, 15, 20, and 29 further require, in addition to the different repetition rates, a variety of other ways of achieving first and second output powers, such as the use of different spot sizes. Although the specification describes each of these features independently, it does not disclose using them together in such a manner as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification presents different repetition rates and different spot sizes, for example, as *alternatives* to one another, rather than complimentary methods which could be used together as claimed. See page 18 of the instant application.

This rejection treats claim 29 as depending from claim 1.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 29 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what the proper dependency of claim 29 should be.

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See In re Goodman, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); In re Longi, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); In re Van Ornum, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); In re Vogel, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, In re Thorington, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claim 31 is rejected under the judicially created doctrine of double patenting over claim 1 of U. S. Patent No. 5,593,606 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter. The subject matter of claim 1 of U. S. Patent No. 5,593,606 is fully covered by presently pending claim 31.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See In re Schneller, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,593,606 to Owen et al. (Owen '606) in view of U.S. Patent 4,644,130 to Bachmann, Japanese patent publication 63-112088 to Takahashi et al. and Japanese patent publication 3-66488 to Sakuma.

It is first noted that Owen '606 qualifies as prior art under 35 U.S.C. 102(e) against claims 33 and 34 for the following reasons. It is the work of "another" as the inventive entity of Owen '606, namely Owen/O'Brien, is different from the inventive entity of the instant application, namely Owen/Larson/Puymbroeck. It has an earlier effective filing date. The effective filing date of claims 33 and 34 of the instant application is the actual filing date of 5/17/96, because these claims are not supported by the parent application. MPEP 2133.01. The effective filing date of Owen '606 is 7/18/94. See item 15 below for a further explanation regarding claim 33.

Turning to content, and referring to col. 11, Example 8 in particular ("blind vias were produced by processing the organic dielectric and the metal layers at different peak powers"), and the entire patent in general, Owen '606 discloses a method for laser machining a self-limiting blind via in a multilayered target including at least first and second conductor layers (two layers of cooper in Example 8) having respective first and second conductor ablation thresholds and a dielectric layer (epoxy glass or polyimide in Example 8) having a dielectric ablation energy threshold, the conductor layers being above and below the dielectric layer. The method comprises generating a first laser output with a wavelength of less than 400 nm and containing at least one first laser pulse having a first energy density over a first spatial spot size, the first energy density necessarily and inherently being greater than the first conductor ablation energy threshold (or the material would not be removed), applying the first laser output to the target to remove the first conductor layer, generating a second laser output having a wavelength of less than 400 nm and containing at least one second laser pulse having a second energy density over a second spatial spot size, the second energy density being different from the first and necessarily and inherently greater than the dielectric ablation energy threshold (or the material would not be removed), and applying the second laser output to the target to remove the dielectric layer within the second spot area. The first and second laser outputs have different peak powers.

Owen '606 does not specifically state that the second energy density is less than the first and second conductor ablation energy thresholds, and does not show changing the position of the workpiece relative to a focal plane to produce the two different energy densities.

Referring to col. 3, lines 1-5, Bachmann shows that it is known in the art to produce a depthwise self-limiting blind via by applying a laser output to a dielectric layer located above a metal layer such that the energy density of the laser output is greater than the dielectric ablation threshold, but less than the conductor ablation energy threshold. The vias thus produced are said to have a high reliability, as material erosion stops at the conductor layer. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a second energy density in Owen '606 of less than the first and second conductor ablation energy thresholds, to ensure that material erosion stops at the lower conductor layer and thereby produce a blind via of high reliability as taught by Bachmann.

Further, although Owen '606 shows changing the energy incident on the target area (i.e., the energy density) by changing the power output of the laser, it would have been equally obvious to one of ordinary skill in the art at the time the invention was made to change the energy density by changing the spot size of the laser upon the target area by changing the position of the target relative to a focal plane of the laser since the examiner takes Official Notice of the equivalence of the step of changing a laser's output power and the step of changing a spot size for their use in the laser machining art ($E_d = (P/A) * t$), and since both Sakuma (Fig. 1) and Takahashi (Figs. 1 and 2) show that it is known in the art to adjust the energy incident on a target by positioning the target at various distances from a focal plane of the laser to conveniently achieve a required change in spot size and hence energy density.

12. Claims 1, 2, 4-6, 9-13, 16-18, 21, 22, 24, and 26 are allowed.

13. Claim 32 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. As allowable subject matter has been indicated, applicant's reply must either comply with any formal requirements herein or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

15. Applicant's arguments filed 3/10/98 have been fully considered with the following results.

Applicant's arguments with respect to claims 1 and 32 are convincing.

Applicant's arguments with respect to claims 33 and 34 are moot in view of the new grounds of rejection, particularly given the disclosure of Japanese patent publication 3-66488 to Sakuma. The examiner cannot agree that changing the spot size renders claims 33 and 34 non-obvious given the scope and contents of the prior art.

Applicant's arguments with respect to claim 31 are convincing, but a terminal disclaimer is required.

Regarding claim 33, a unique situation exists. Independent claim 31 is fully supported by the parent application, 08/276,797, now Owen '606. Accordingly Owen '606 is not prior art

against independent claim 31 because the effective filing dates of Owen '606 and claim 31 of the instant application are identical. However, dependent claim 33 is not fully supported by the parent application, and therefore has an effective filing date equal to the actual filing date of this application, which is 5/17/96. Owen '606 is therefore available as prior art against claim 33. Thus the dependent claim is rejected on the prior art, but the independent claim is not.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory Mills whose telephone number is (703) 308-1633. The examiner can normally be reached on Monday through Friday from 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Prince Willis can be reached on (703) 308-3050. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3599.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gregory Mills
March 31, 1998

GREGORY L. MILLS
PATENT EXAMINER